

## REMARKS

Claims 1-9 and 11-20 were previously pending in the application. No claims have been amended or canceled. Reconsideration and withdrawal of the rejection is respectfully requested in view of the following remarks.

1. **Rejection of claims 1-9, 11-12 under 35 U.S.C. § 103(a), as being unpatentable over Woltering et al. (WO 02/38685, citations based on English equivalent, US 7,041,729) in view of Mayer et al. (EP 0 708 788, citations based on English equivalent, US 6,372,875) and Ott et al. (DE 100 40 223, citations based on English equivalent, US 2003/0144413) and evidenced by Wilmes et al. (US 5,981,653)**

The Office Action states:

“Woltering et al. teaches pseudoplastic powder clearcoat slurries comprising particles which are solid and/or high viscosity and are dimensionally stable under storage and application conditions and comprise as binder at least one polyol (Abs). The binder will therefore be incorporated into the dimensionally stable particles. The slurry also comprises water (8:60-65) and hence is aqueous. The binder preferably has a minimum film-forming temperature (T<sub>g</sub>) greater than 30°C (8:40-45), must carry hydroxyl groups (i.e. it is a polyol) (4:15-20), and may be polyurethanes (4:35-45). Woltering teaches the highly suitable polyurethanes being those described in EP 0 708 788 (5:15), which comprise cycloaliphatic diisocyanates such as isophorone diisocyanate and dicyclohexylmethane diisocyanate (6:20-35 of Mayer). At the time of the invention a person of ordinary skill in the art would have found it obvious to have used the polyurethanes, as taught in Mayer, in the invention of Woltering, as the highly suitable polyurethanes taught in Woltering (5:15 of Woltering).

Woltering does not teach the polyurethanepolyol free of ionic and potentially ionic groups. However, Ott et al. teaches pseudoplastic powdered lacquer slurries wherein "particle sizes for use in accordance with the invention are obtained even without the aid of additional external emulsifiers if the binder comprises ion-forming groups" and "it is preferred to aim for a low level of such groups, since when the customary crosslinking agents are used, free groups of this kind remain in the film and may reduce the resistance to ambient substances and chemicals" (paragraphs 0068-9). By removing the ionic groups from the polyurethane, the polyol would be substantially hydrophobic. Woltering and Ott are analogous art because they are from the same field of endeavor, namely pseudoplastic aqueous dispersions. At the time of the invention a person of ordinary skill in the art would have found it obvious to have used external emulsifiers, as taught by Ott, in the invention of Wolterling, in order to increase the resistance to ambient substances and chemicals. Additionally, while it seems antithetical to use external emulsifiers when the prior art teaches a preference for internal emulsifiers, Wilmes et al. teaches aqueous polyurethane powder coating compositions wherein it is possible to use polyhydroxyl compounds which are not hydrophilic or are not sufficiently hydrophilic to be water dispersible, provided that they are blended with external emulsifiers (3:45- 50). It is

therefore clear from the prior art that external emulsifiers are an equivalent alternative to internal emulsifiers, and coupled with Ott's preference for a minimal amount of free ionic groups, an obvious modification of the prior art.

[03/26/2009 Office Action page 2, indented para. 3]

Applicants agree that this mostly amounts to a fair reflection of the prior art. The patentability of the present invention can be shown, however, by pointing out the following fallacy: "It is therefore clear from the prior art that external emulsifiers are a [complete] equivalent alternative to internal emulsifiers [with respect to the claimed compound], and coupled with Ott's preference for a minimal amount of free ionic groups, an obvious modification of the prior art."

Thus, even granting everything else stated in the Office Action quoted above, that does not teach the present invention, but rather is consistent with the cited prior art teaching away from the present invention as more fully explained in Applicants' 14-page amendment of December 30, 2008 and Applicants' Response of January 30, 2009. The only difference from the previous Office Action rejections is the addition of, not a tertiary reference, but a quaternary reference, Wilmes et al. (hereafter "Wilmes.")

To review the previous prosecution, the present invention, as a whole, is not merely the sum of its individual parts selected, with hindsight, from the prior art, but a series of total changes that represent a solution to the various matrix of problems present in the prior art. Hence, it is clear from tracing the prior art, that a series of improvements or changes tended to produce a corresponding disadvantage, with not each and every problem solved simultaneously. Thus, the prior art has never been a matter of having one's cake and eating it too. The art of pseudoplastic powder clearcoat slurries has been a matter of research and development, with the goal of further improvements, the research and development requiring empirical testing (as in the present application), since the chemistry involved, as a whole, is just not predictable. As discussed during prosecution, the composition involves issues of initial drying, popping, surface defects, blushing, chemical resistance, chemical stability, cracking, leveling, and so forth.

Perhaps to better explain why the Examiner's explanation does not arrive at the invention from the prior art, one might consider that (1) it is true that a hydrophilic particle may be used

with no external emulsifier, (2) a hydrophobic particle may be used with some external emulsifier and some internal emulsifier; and (3) some of the external emulsifier may be inversely changed with the amount of the internal emulsifier. This is evident from all of the four references cited in the rejection, granted. However, it simply does not follow from that that all of internal emulsification should be replaced with all of external modifier, particularly with respect to any polyurethanepolyol, because they in fact are clearly not equivalent as a whole. There is no prior art that teaches that the claimed hydrophobic solid polyurethane polyol comprising cycloaliphatic structural units should be used only with external emulsification, in which all of the internal emulsification can be replaced with only external emulsification. That is critically missing from the Office Action. That is the invention. Thus, the Office Action explains the prior art, but not the invention.

Mayer fails to address the above issues and, hence, cannot correct the deficiencies of Woltering. Mayer discloses only one piece of the puzzle in the prior part.

Wilmes, the only new reference compared to previous prosecution, is cited for the reason that “while it seems antithetical to use external emulsifiers when the prior art teaches a preference for internal emulsifiers, Wilmes et al. teaches aqueous polyurethane powder coating compositions wherein it is possible to use polyhydroxyl compounds which are not hydrophilic or are not sufficiently hydrophilic to be water dispersible, provided that they are blended with external emulsifiers (3:45- 50).” Applicants submit, however, that Wilmes merely reinforces the deficiencies of the other prior art, discussed above. In fact, Wilmes states:

It is also possible to use polyhydroxyl compounds which are not hydrophilic or not sufficiently hydrophilic to be water dispersible, provided that they are blended with external modifiers.

Applicants submit, however, that since Wilmes only teaches hydrophilic compounds, there is no teaching as to equivalence. Equivalence with respect to what, an unknown compound?

It is respectfully submitted, moreover, that all three references of which Wilmes is supposed to provide evidence require ionic groups. Literally it is not merely a “preference” in any of the references. A requirement is not subject to a change of preferences.

Although Applicants can understand the Examiner's position that both external and internal emulsifiers have known use, in general, for providing compatibility of polyurethanes with water, an important point is that the prior art strongly suggests, in the particular kind of pseudoplastic aqueous dispersions used in the cited prior art, that this is undesirable, perhaps even not functional. Clearly, each reference would not have required ionic groups if its use was thought equivalent to an external emulsifier, especially since Ott suggests it is desirable to attempt to lower the number of ionic groups. That is explicitly contrary to equivalence. If ionic groups were considered unnecessary, therefore, it would have made sense to mention that possibility, which the Examiner concedes is absent from Ott. Thus is particularly true with respect to the claimed polyurethanepolyol compound.

So it is a matter of practical logic that, since each and reference in the reference requires ionic groups, including claims or all examples, that Mayer, Ott, and Woltering strongly support the teaching that the (potential) ionic groups are, in fact, not completely replaceable, particularly with respect to the claimed polyurethanepolyol.

The test, in modifying Woltering with all the other prior art references, is not whether the composition would still be usable, although that would be unpredictable, but whether the skilled artisan would find it equivalent or *prima facie* obvious.

As mentioned in Applicants' Amendment of October 30, 2008, Woltering requires that the composition must be free of external emulsifiers. Abstract. Woltering, in fact, requires that the particles are used in dispersion with, as binder, at least one polyol with an OH number >110 mg KOH/g, containing potentially ionic groups, such that the powder clearcoat slurry has a potentially ionic group content of from 0.05 to 1 meq/g of solids. (Woltering, Abstract, emphasis added). Regarding Mayer, this patent similarly requires at least one compound containing two groups which are reactive toward isocyanate groups containing, at least in part, at least one group capable of forming anions which is neutralized before or after incorporation into the polyurethane molecule. (Mayer, abstract, emphasis added). It does not follow that Ott teaches the use of external emulsifiers, when both Ott and Woltering state their compositions are free of external modifiers. Second, it does not follow that a reduction in ion-forming groups means that the

composition is free of ion-forming groups. Rather, the ion-forming groups are still necessary in Ott, just preferably at a low level in order to improve chemical resistance. Thus, the Office Action, reads "being free from" (ionizable groups) into Ott when Ott requires such groups, albeit preferably at relatively low levels.

The courts have held that "[i]f the proposed modification would render the prior art invention being modified unsatisfactorily for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon* 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir. 1984). [Emphasis added.] The courts have also held that "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti* 270 F. 2d 810, 123 USPQ 349 (CCPA 1959). [Emphasis added.]

A *prima facie* case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. *In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997), emphasis added. It is respectfully submitted that requiring an element, that is described as necessary, the absence of which is taught to be significantly disadvantages, does represent a teaching away.

In view of the above, Applicants respectfully assert that claims 1-9 and 11-20 are patentable under 35 U.S.C. §103(a). Withdrawal of this rejection is respectfully requested.

2. **Rejection of claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Woltering et al. (WO 02/38685, citations based on English equivalent, US 7,041,729) in view of Mayer et al. (EP 0 708 788, citations based on English equivalent, US 6,372,875) and Ott et al. (DE 100 40 223, citations based on English equivalent, US 2003/0144413) and evidenced by Wilmes et al. (US 5,981,653).**

Claim 13 is directed to a process of preparing the polyurethanepolyol of claim 1. The Office Action basically repeats the rejection of claim 1, with the same prior art references. Those references are discussed above and the same reasoning applies here. The prior art references do not teach the composition made in the claimed process.

The Office Action basically repeats the rejection of claim 1, with the same prior art references. Those references are discussed above and the same reasoning applies here. The prior art references do not teach the composition made in the claimed process.

**3. Rejection of claims 14-20 under 35 U.S.C. § 103(a) as being unpatentable over Woltering et al. (WO 02/38685, citations based on English equivalent, US 7,041,729) in view of Mayer et al. (EP 0 708 788, citations based on English equivalent, US 6,372,875) and Ott et al. (DE 100 40 223, citations based on English equivalent, US 2003/0144413) and evidenced by Wilmes et al. (US 5,981,653) and in view of Ott et al. (US 6,485,793).**

Claim 14 is directed to a dispersion comprising the polyurethanepolyol of claim 1, with further limitations being that the polyurethanepolyol in the pseudoplastic aqueous dispersion has a glass transition temperature greater than 40°C and that the polyurethanepolyol is a product of reacting a cycloaliphatic diol, comprising cycloaliphatic structural units, with a polyisocyanate in a molar ratio such that the ratio of hydroxyl to isocyanate groups is from 1.1:1 to 2:1. Claim 16 requires that the polyurethanepolyol comprises at least five cycloaliphatic structural units. Claim 17 requires that the pseudoplastic aqueous dispersion further comprises a solution polyacrylate resin, and claim 18 further requires that the solution polyacrylate resin comprises a repeat unit of hydroxyethyl methacrylate. Claim 19 further requires that the solid and/or high-viscosity particles that are dimensionally stable under storage and application conditions comprise a crosslinking agent that is a blocked polyisocyanate, and claim 20 requires that the particles are present in an amount of 30 to 65% by weight.

The Office Action basically repeats the rejection of claim 1, with the same prior art references. Those references are discussed above and the same reasoning applies here. The prior art references do not teach the composition made in the claimed process. The Office Action further states:

Mayer additionally teaches that the NCO:OH ratio is between 2:1 to 1:1 (4:65- 67). At the time of the invention a person of ordinary skill in the art would have found it obvious to have used the polyurethanes, as taught in Mayer, in the invention of Woltering, as the highly suitable polyurethanes taught in Woltering (5:15 of Woltering).

It is noted that, in order to arrive at claims 14-20 from the prior art, further selections are required. That means that not only must a very particular polyurethanepolyol compound be selected, and not only must one modify Woltering and the other references contrary to its teachings as a whole, but one must select a ratio with respect to the particular kind of polyurethanepolyol selected, i.e. restrict use of the polyurethanepolyol with respect to other combinations. Thus, a series of selections and departures from the prior art are being built up far beyond the point of predictability, it being noted that already four different prior art references, with widely different teachings, are being used as a source of the arbitrary selections.

### **Response to Arguments**

The Office Action states, with respect to Applicant's arguments filed 1/30/09, that, in response to applicant's allegations of unexpected results, the table shows a comparison between the absence of a polyurethanepolyol and its presence, however this shows nothing regarding the presence of internal or external emulsifiers. Additionally, the closest prior art contains polyurethanepolyols with internal emulsifiers.

The experimental comparison in the present application is quite relevant to the unexpected properties, and hence, patentability of the presently claimed invention. It provides indirect evidence with respect to several other approaches in the prior art, including those with the use of internal modifiers. The Applicants note that Woltering wishes to eliminate blushing without losing chemical resistance and, at the same time, avoid popping and other surface defects. Hence, the purpose of Woltering resembles that of the present invention. Woltering attempts to solve these problems in an entirely different way, by introducing potentially ionic groups in a secondary particle or polyol binder having a high OH number, in a composition free from organic solvents and external emulsifiers. Col. 2, lines 3-39. Hence, the proposed modification to Woltering would defeat the very purpose of Woltering according to Woltering. That is a disadvantage. All of the Examples in Woltering provide an acid number, as a measure of the potentially ionizable

groups in the polyol. It is a combination of the acid number and OH number which achieves “the object on which the present invention is based.” Woltering, column 2 lines 57-65. Not to achieve the object of the invention is also a disadvantage.

The Examples in the present application show unexpectedly superior results as shown in Table 2, on page 21, of the present specification, in which clearcoat according to the invention did not show blushing, was able to achieve a glossy appearance, and did not show surface defects (very good leveling and no pops), as compared to V2, without the polyurethanepolyol component, which showed surface defects and less chemical resistance. It is respectfully submitted, contrary to the suggestion by the Examiner, that direct comparative examples with respect to an internal emulsifier are not necessary for giving due weight to unexpected results. Furthermore, the suggested new comparison represents a comparison to a theoretical obviousness rejection, since there are no examples in the closest prior art that does not contain (potentially) ionic groups in which to compare. Hence, a non-present example in the prior art is not the closest prior art.

The present compositions were unexpectedly found to be an improvement in simultaneously avoiding all of the problems in the prior art, representing an improvement over all the prior art in one respect or another. The Office Action has failed to explain why advantages in all the prior art can be combined and associated with disassociated structural elements selected from various prior art references.



## CONCLUSION

Applicants respectfully submit that the Application and pending claims are patentable in view of the foregoing remarks. A Notice of Allowance is respectfully requested. As always, the Examiner is encouraged to contact the Undersigned by telephone if direct conversation would be helpful.

Respectfully Submitted,

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